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(72) Inventors:
• **Sun, Ellen Y.**
South Windsor, CT 06074 (US)
• **Eaton, Harry. E.**
Woodstock, CT 06281 (US)

(30) Priority: **19.12.2001 US 33955**

(74) Representative: **Hall, Matthew Benjamin**
Frank B. Dehn & Co.
179 Queen Victoria Street
London EC4V 4EL (GB)

(71) Applicant: **United Technologies Corporation**
Hartford, Connecticut 06101 (US)

(54) **Silicon based substrate with environmental/thermal barrier layer**

(57) An article comprising a substrate containing silicon and at least one barrier layer which functions as a thermal barrier at temperatures in excess of 1300°C in aqueous environments. In one embodiment there is provided a substrate comprising silicon and at least one barrier layer containing TaO_x (where x = 1 to 3), for ex-

ample, Ta₂O₅, and an oxide selected from the group consisting of MgO, CaO, SrO, BaO, Al₂O₃, Y₂O₃, La₂O₃, Re₂O₃ (where Re is a rare earth element) and mixtures thereof.

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PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention EP 02 25 8676
shall be considered, for the purposes of subsequent
proceedings, as the European search report

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
P,X	WO 02 077418 A (HONEYWELL INT INC) 3 October 2002 (2002-10-03) * claims 1,4,5 * * examples * * page 2, line 1 - line 3 * * paragraphs [0013],[0017] * ---	1-17	C04B41/87 C04B41/89 C23C4/10 F01D5/28
X	US 5 736 198 A (SAITO YUKIO ET AL) 7 April 1998 (1998-04-07) * claim 109 * ---	1-15,17	
A	EP 1 044 943 A (GEN ELECTRIC ;NASA (US); UNITED TECHNOLOGIES CORP (US)) 18 October 2000 (2000-10-18) * the whole document * ---	1-17	
A	US 5 578 349 A (KOSHKARIAN KENT A ET AL) 26 November 1996 (1996-11-26) * the whole document * -----	1-17	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			C04B C23C F01D
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search		Date of completion of the search	Examiner
MUNICH		22 October 2003	Rosenberger, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C07)



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**INCOMPLETE SEARCH
SHEET C**

Application Number
EP 02 25 8676

Claim(s) searched completely:
8-11

Claim(s) searched incompletely:
1-7,12-17

Reason for the limitation of the search:

Present claims 1 relates to a product defined by reference to a desirable characteristic or property, namely that an undefined additive is included in the barrier layer in an undefined amount in order to reduce the rate of weight loss and recession of the substrate at temperatures in excess of 1300°C in aqueous environments. The claims cover all products having this characteristic or property, whereas the application provides support within the meaning of Article 84 EPC and disclosure within the meaning of Article 83 EPC for only a very limited number of such products.

In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 84 EPC).

An attempt is made to define the product by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to an article comprising a substrate comprising silicon and at least one barrier layer, wherein the at least one thermal barrier layer contains TaO_x where $x = 1$ to 3 and an oxide selected from the group consisting of MgO, CaO, SrO, BaO, Al₂O₃, Y₂O₃, La₂O₃ and Re₂O₃.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 8676

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-10-2003

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